

SEQUENCE LISTING

<110> University of California

5<120> Bryostatins, Bryopyrans and Polyketides: Compositions
and Methods

<130> 1183.010W01

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<150> 60/147,283

<151> 1999-08-04

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<160> 38

<170> PatentIn Ver. 2.1

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<213> Endobugula sertula

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<222> (1)..(17)

<223> N in this sequence refers to I or inosine

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<210> 2

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<223> N in this sequence refers to I or inosine

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0975938-013101

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35<211> 105

<212> PRT

<213> Endobugula sertula

<400> 10

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0975938.013104

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Val Tyr Thr Asp Lys Arg His Tyr Cys Ala Leu Gly Ser Val Lys Ser
20 25 30

5

Asn Ile Gly His Leu Gly Val Gly Ala Gly Ile Ala Gly Val Thr Lys
35 40 45

Val Leu Leu Ser Leu Gln His Arg Met Leu Pro Pro Thr Ile His Cys
10 50 55 60

Glu Asp Val Asn Pro Gln Ile Ala Leu Glu Gly Ser Pro Phe Tyr Ile
65 70 75 80

15Asn Thr Glu Leu Lys Pro Trp Gln Ser Gly Asp Gly Ile Pro Arg Arg
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Ala Gly Val Ser Ser Phe Gly Val Ser
100 105

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5<213> Endobugula sertula

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20 25 30

Asn Ile Gly His Leu Gly Val Gly Ala Gly Ile Ala Gly Val Thr Lys

15 35 40 45

Val Leu Leu Ser Leu Gln His Arg Met Leu Pro Pro Thr Ile His Cys

50 55 60

20Glu Asp Val Asn Pro Gln Ile Ala Leu Glu Gly Ser Pro Phe Tyr Ile

65 70 75 80

Asn Thr Glu Leu Lys Pro Trp Gln Ser Gly Asp Gly Ile Pro Arg Arg

85 90 95

25

Ala Gly Val Ser Ser Phe Gly Val Ser Gly Thr Asn Ala His Leu Val

100 105 110

Leu Glu Glu Tyr Thr His Arg Val Thr Ser Pro Leu Gln Asn Thr Ile

30 115 120 125

Leu Pro Gln Asn Gly Leu Phe Ile Val Pro Leu Ser Ala Lys Asn Asp

130 135 140

35Glu Cys Leu Asn Ala Cys Val Glu Arg Leu Leu Phe Phe Leu Lys Ser

145 150 155 160

Arg Gln Ser Asp Thr Tyr Lys Lys Tyr Ser Leu Ser Asp Thr Ala Pro

165 170 175

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0977930460

Ile Leu Leu Asp Leu Ala Tyr Thr Leu Gln Val Ser Arg Glu Ala Met
 180 185 190

Thr Lys Arg Val Ala Phe Val Val Lys Thr Thr Ile Glu Leu Met Glu
 5 195 200 205

Lys Leu Asn Ala Phe Ile Glu Lys Gln Asn Thr Ile Lys Ala Ser Asn
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Asn Glu Ser Thr Asp
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<212> PRT

<213> Endobugula sertula

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<400> 14

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<213> Endobugula sertula

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	tctggtgtgg	ctggtataca	caagggtgctg	ttatcgctta	agcatcgaca	attagtagcg	180
	agcctgcatt	ttaatagcgc	caatcaccac	tttgattttc	aacagtcgcc	tttttatgtc	240
	aatacccagc	taaggccctg	ggatcaagca	gagggactag	aagaaagccg	ccgccgggct	300
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<213> Endobugula sertula

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40 1 5 10 15

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<400> 18
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Arg Gly Arg Asn Gln Lys Asn Arg Leu Leu Val Gly Ser Val Lys Ala

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25

30

5

Asn Ile Ser His Leu Glu Ala Ala Gly Gly Ile Ser Gly Leu Ile Lys

35

40

45

Ala Val Leu Ala Met Gln His Gly Val Ile Pro Gln Gln Leu His Cys

10

50

55

60

Lys Glu Pro Ser Pro His Ile Pro Trp Lys Arg Leu Pro Leu Asp Leu

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70

75

80

15Val Gln Glu Gln Thr Val Trp Pro Glu Ser Glu Glu Arg Ile Ala Ala

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Val Thr Ala Ser Asp

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25<213> Endobugula sertula

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30gctgggtttta ttaaaacggt gctgtctctt taccatggca aaattgcacc caatgcaggc 180

aataccgagc ccaatgcagc tttgaacctt gacgcgtttc attttgcatt accaaaaact 240

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<213> Endobugula sertula

40<400> 20

0975938 865460

<400> 22

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Gly His Leu Glu Ala Thr Ala Gly Val Ala Ala Leu Ile Lys Ala Val
 35 40 45

10

Leu Val Leu Gln His Gly Val Ala Pro Ala Asn Leu His Cys His Lys
 50 55 60

Leu Asn Pro Leu Leu Asp Ile Asp Gly Phe Asn Val Val Phe Pro Gln
 15 65 70 75 80

Ser Glu Thr Pro Leu His Ser Ser Leu Gln Leu Leu Gly Gly Tyr Gln
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20Phe Val Arg Val Trp
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<212> DNA

<213> Endobugula sertula

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35 40 45

Leu Leu Ala Leu Lys His Lys Gln Leu Pro Pro Ser Cys His Leu Val
50 55 60

15
Lys Ile Asn Glu His Ile Asn Leu Glu Asp Ser Pro Phe Tyr Ile Asn
65 70 75 80

Thr Ala Leu Lys Lys Trp Glu Val Ser Glu Gly Glu Ala Arg Arg Ala
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Ala Val Ser Ser Phe Gly Ser
100

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<212> DNA

<213> Endobugula sertula

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gtcgcgtggtc	tcatcaagac	ggtgatggca	ctcaaggcgc	gtcagatacc	gcctagcttg	180
35cactttgaga	cccccaatcc	gcagatcgat	tttgccgaca	gtccctttta	tgtaaataca	240
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<400> 28

Val Val Gly Asp Pro Ile Glu Val Val Gly Leu Thr Lys Ala Tyr Gln

1

5

10

15

10Ala His Thr Gln Glu Arg Gln Tyr Cys Gly Leu Gly Ser Val Lys Thr

20

25

30

Asn Ile Gly His Thr Asp Ser Ala Ala Gly Ile Ala Gly Leu Leu Lys

35

40

45

15

Ile Val Met Ala Met Lys His Arg Gln Leu Pro Pro Ser Leu Asn Phe

50

55

60

Glu Thr Pro Asn Pro Asp Leu Asp Leu Glu Asn Ser Pro Phe Phe Ile

20 65

70

75

80

Gln Thr Lys Leu Lys Asp Trp Glu Ser Val Gly Pro Arg Arg Ala Ala

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90

95

25Leu Ser Ser Phe Gly Leu Gly

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35<221> misc_feature

<222> (386)..(388)

<223> TAG may represent a transposase open reading frame

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40<221> misc_feature

0075928.04104

<222> (444)..(449)

<223> TTGAAA may be a possible -35 trascription control
sequence

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<222> (458)..(463)

<223> GATAAT may be a possible -10 trascription control
sequence

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<222> (474)..(502)

<223> ATCAATAAAAA and TTTTATTGAT are inverted repeats

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<222> (576)..(583)

<223> TGAGGAAT may be a possible SD sequence

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<222> (565)..(567)

<223> ATG encoding M is presumptive start of PKS Open

25 reading frame

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<222> (589)..(591)

30<223> GTG encoding V is is possible alternative start of
PKS Open reading frame

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<223> N refers to any nucleotide

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<400> 30

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<223> N refers to any nucleotide

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TOP SECRET

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<213> Endobugula sertula

40<220>

<221> misc_feature

<222> (1)..(2672)

<223> N refers to any nucleotide

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<222> (1)..(2169)

30<223> N refers to any nucleotide

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30

Ile Lys Arg Lys Asp Lys Lys Ser Lys Gln Arg Leu Asn His Asp Arg
 35 40 45

Glu Leu Asn Arg Ser Met Asn Ile Thr Pro Lys Ile Val Asn Asn Tyr
 5 50 55 60

Gly Leu Val Leu Leu Gly Gly His Leu Phe Glu Glu Leu Arg Leu Ser
 65 70 75 80

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 85 90 95

Lys Ala Ser Ala Ile Ser Phe Thr Asp Thr Leu Cys Val Gln Gly Leu
 100 105 110

15 Tyr Pro Ser His Tyr Pro Phe Val Pro Gly Phe Glu Val Ser Gly Val
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Ile Arg Gln Val Gly Glu His Ile Thr Asp Leu His Val Gly Asp Glu
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Val Ile Ala Phe Thr Gly Ser Ser Met Gly Gly His Ala Ala Tyr Val
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25Thr Val Pro Gln Asp Tyr Val Val Arg Lys Pro Lys Asp Leu Ser Phe
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Glu Asp Ala Cys Ser Phe Pro Leu Ala Phe Ala Thr Val Tyr His Ser
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30 Phe Ala Arg Gly Lys Leu Ser His Asn Asp His Ile Leu Ile Gln Thr
 195 200 205

Ala Thr Gly Gly Cys Gly Leu Met Ala Leu Gln Leu Ala Arg Leu Lys
 35 210 215 220

Gln Cys Val Cys Tyr Gly Thr Ser Ser Arg Glu Asp Lys Leu Ala Leu
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40Leu Lys Gln Trp Ala Leu Pro Tyr Val Phe Asn Tyr Lys Thr Cys Asn

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245

250

255

Ile Asp Glu Glu Ile Gln Arg Val Ser Gly His Arg Gly Val Asp Val

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265

270

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Val Leu Asn Met Leu Pro Gly Glu His Ile Gln Gln Gly Leu Asn Ser

275

280

285

Leu Ala Lys Gly Gly Arg Tyr Leu Glu Leu Ser Met His Gly Leu Leu

10 290

295

300

Thr Asn Glu Pro Val Ser Leu Ser Ser Leu Arg Phe Asn Gln Ser Val

305

310

315

320

15Gln Thr Ile Asn Leu Leu Gly Leu Leu Asn Lys Gly Asp Asp Gly Phe

325

330

335

Ile Gly Ser Val Leu Ala Gln Met Val Ser Trp Ile Glu Ser Gly Asp

340

345

350

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Leu Val Ser Thr Val Ser Arg Ile Tyr Pro Leu Asp Gln Ile Gly Glu

355

360

365

Ala Leu Arg Tyr Val Ser Glu Gly Glu His Ile Gly Lys Val Val Val

25 370

375

380

Ser His Thr Ala Thr Glu Pro Met Asp Cys Arg Gln Arg Cys Ile Asp

385

390

395

400

30Asn Val Leu Lys Gln Gly Gln Met Ala Ala Leu Thr Ala Thr Gly Gly

405

410

415

Lys Ser Arg Val Trp Gly Gly Thr Gly Val Asn Asp Lys Pro Ser Pro

420

425

430

35

Ala Val Gly Ile Glu Glu Arg Leu Leu Glu Gly Ile Ala Val Ile Gly

435

440

445

Leu Ser Gly Gln Tyr Pro Lys Ser Lys Thr Leu Glu Gln Phe Trp Gln

40 450

455

460

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 465 470 475 480

Trp Ser Leu Glu Glu Tyr Tyr Ser Pro Ile Pro Glu Gly Gly Lys Thr
 5 485 490 495

Tyr Cys Lys Trp Met Gly Val Leu Glu Asp Met Asp Cys Phe Asp Pro
 500 505 510

10Leu Phe Phe Ala Ile Ser Pro Arg Glu Ala Glu Val Met Asp Pro Gln
 515 520 525

Gln Arg Leu Phe Leu Glu Asn Ala Trp Ser Cys Ile Glu Asp Ala Gly
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 Ile Asn Pro Lys Met Leu Ser Arg Ser Arg Cys Gly Val Phe Val Gly
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Cys Gly Ala Asn Asp Tyr Ser Ala Leu Met Asn Ser Ser His Ser Thr
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Ser Leu Glu Leu Met Lys Glu Leu Gly Asn Asn Ser Ser Ile Leu Ser
 580 585 590

25Ala Arg Ile Ser Tyr Phe Leu Asn Leu Lys Gly Pro Cys Leu Ala Ile
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Asp Thr Ala Cys Ser Ser Ser Leu Val Ala Ile Ala Glu Ser Cys Asn
 610 615 620

30
 Ser Leu Val Leu Gly Thr Ser Asp Leu Ala Leu Ala Gly Gly Val Leu
 625 630 635 640

Leu Met Pro Gly Pro Ser Leu His Ile Gly Leu Ser His Gly Glu Met
 35 645 650 655

Leu Ser Val Asp Gly Arg Cys Phe Thr Phe Asp Gln Arg Ala Asn Gly
 660 665 670

40Phe Val Pro Gly Glu Gly Val Gly Val Val Leu Leu Lys Arg Met Ser

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675

680

685

Asp Ala Val Arg Asp Gly Asp Pro Ile Arg Ala Val Ile Arg Gly Trp
 690 695 700

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Gly Val Asn Gln Asp Gly Arg Ser Asn Gly Ile Thr Ala Pro Ser Ser
 705 710 715 720

Lys Ala Gln Ser Ala Leu Glu Gln Glu Val Tyr Gln Arg Phe Asn Ile
 10 725 730 735

Asp Pro Ser Ser Ile Thr Leu Val Glu Ala His Gly Thr Gly Thr Lys
 740 745 750

15Leu Gly Asp Pro Ile Glu Val Glu Ala Leu Ala Glu Ser Phe Arg Val
 755 760 765

Tyr Thr Asp Lys Arg His Tyr Cys Ala Leu Gly Ser Val Lys Ser Asn
 770 775 780

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Ile Gly His Leu Gly Val Gly Ala Gly Ile Ala Gly Val Thr Lys Val
 785 790 795 800

Leu Leu Ser Leu Gln His Arg Met Leu Pro Pro Thr Ile His Cys Glu
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Asp Val Asn Pro Gln Ile Ala Leu Glu Gly Ser Pro Phe Tyr Ile Asn
 820 825 830

30Thr Glu Leu Lys Pro Trp Gln Ser Gly Asp Ser Ile Pro Arg Arg Ala
 835 840 845

Gly Val Ser Ser Phe Gly Phe Ser Gly Thr Asn Ala His Leu Val Leu
 850 855 860

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Glu Glu Tyr Leu Pro His Ser Thr Gly Thr Ile Glu Ser Phe Ala Ala
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Asn His Ala Ser Thr Val Ile Ile Pro Leu Ser Ala Lys Ser His Asn
 40 885 890 895

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Ser Leu Tyr Thr Tyr Ala Gln Thr Leu Leu Ile Phe Leu Lys Arg Ser
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Gln Val Thr Asp Ala Lys Lys Ile Thr Ile Asp His Met Glu Cys Arg
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Leu Leu Asp Leu Ala Tyr Thr Leu Gln Val Gly Arg Glu Ala Met Asp
 930 935 940

10 Lys Arg Ile Ser Phe Ile Val Asn Thr Lys Gln Ala Leu Val Glu Lys
 945 950 955 960

Leu Asn Ala Phe Leu Glu Lys Glu Lys Thr Ile Thr Asp Cys Tyr His
 965 970 975

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 Tyr Leu Phe Asp Ser Asp Lys Pro Ser Thr Glu Ile Phe Arg Leu Asp
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Glu Asp Asp Lys Val Leu Ile Asn Ser Trp Ile Ser Gln Ser Gln Tyr
 20 995 1000 1005

His Lys Leu Ala Glu Ala Trp Ser Gln Gly Leu Asp Ile Asp Trp Thr
 1010 1015 1020

25 Leu Leu Tyr Thr His Ser Ser Thr Pro Arg Arg Ile Ser Leu Pro Thr
 1025 1030 1035 1040

Tyr Pro Phe Ala Arg Asp Arg Tyr Trp Leu Pro Glu Lys Pro Arg Tyr
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 Asn Ala Ala Asn His Pro Val Ser Asn His Gln Thr Thr Thr Gln Asn
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His Ser Arg Phe Ala Ile Asp Thr Asp His Asp Val Val Ala Glu Ile
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Met Gln Lys Thr His Gln Gln Glu Leu Glu Gln Trp Leu Leu Lys Leu
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40 Leu Phe Val Gln Leu Gln His Met Gly Leu Phe Gln His Arg Val Phe

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Leu Glu Trp Lys Asp Asp Ser Val Ala Ala Ala Gln Ala Leu Glu Ser			
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Cys Leu Gln Ala Leu Pro Gly Val Leu Ser Gly Glu Gln Leu Ile Thr			
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Lys Asn Asn Arg Ile Ala Asp Tyr Cys Asn Gln Cys Val Gly Asp Leu			
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Leu Val Gln Phe Ile Glu Ala Arg Leu Ser Arg Asp Ala Asn Ala Arg			
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Asp Leu Val Ala Gln Gly Ile Ser Val Gly Asp Tyr Asp Ile Ala Ile
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Ala Ala Asn Val Leu His Ala Thr Arg Asn Ile His Glu Thr Val Ser
 51345 1350 1355 1360

His Val Arg Gln Ala Leu Ala Ala Asn Gly Leu Leu Ile Leu Asn Glu
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10Phe Ser Gln Lys Ser Val Phe Ser Ser Val Ile Phe Gly Leu Ile Asp
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Gly Trp Ala Leu Ser Glu Asp Thr Gly Leu Arg Ile Pro Gly Ser Pro
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Gly Leu Tyr Pro Lys Gln Trp Gln Ala Val Leu Glu Ala Ser Gly Phe
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Gly Asp Val Glu Phe Pro Leu His Asp Ala Arg Glu Leu Gly Gln Gln
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Ile Ile Leu Ala Thr Asn Ala His Ala Asn Val Ala Ser Asp Leu Ala
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25Thr Ser Val Ile Asp His Ala Pro Lys Arg Leu Pro Ser Ala Glu Val
 1460 1465 1470

Ser Met Asp Glu Arg Val Ser His Asp Ala Met Met Lys Ala Ser Val
 1475 1480 1485

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Lys Gln Leu Leu Val Glu Gln Leu Ser Gln Ser Leu Lys Leu Asp Met
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Asn Glu Ile His Pro Asp Glu Ser Phe Ala Asp Tyr Gly Val Asp Ser
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Ile Thr Gly Ala Ser Phe Ile Gln Gln Leu Asn Asp Thr Leu Thr Leu
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40Thr Leu Lys Thr Val Cys Leu Phe Asp His Ser Ser Val Asn Arg Leu

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Thr Ala Tyr Leu Leu Ser Asp Tyr Gly Asp Asp Ile Ala Gln Trp Leu

1555

1560

1565

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Ala Thr Ala Pro Ala Leu Val Asp His Pro Gln Ser Val Val Ser Gln

1570

1575

1580

Val Leu Pro Glu Arg Ser Pro Ala Ser Thr Gln Ala Lys Pro Leu Pro

101585

1590

1595

1600

Ser Val Pro Pro Ser Leu Ser Met Glu Ser Pro Val Gln Gln Glu Ser

1605

1610

1615

15Ile Ala Ile Ile Gly Met Ser Gly Arg Phe Ala Ala Ser Glu Asn Leu

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1625

1630

Glu Ala Phe Trp Gln Gln Leu Ala Gln Gly Val Asp Leu Val Glu Pro

1635

1640

1645

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Ala Ser Arg Trp Gly Pro Gln Ala Glu Thr Tyr Tyr Gly Ser Phe Leu

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1660

Lys Asp Met Asp Gln Phe Asp Pro Leu Phe Phe Asn Leu Ser Gly Val

251665

1670

1675

1680

Glu Ala Ser Tyr Met Asp Pro Gln Gln Arg Cys Phe Leu Glu Glu Ser

1685

1690

1695

30Trp Asn Ala Leu Glu Asn Ala Gly Tyr Val Gly Asp Gly Ile Glu Gly

1700

1705

1710

Lys Arg Cys Gly Ile Tyr Ala Gly Cys Val Ser Gly Asp Tyr Ala Gln

1715

1720

1725

35

Leu Leu Gly Asp Gln Pro Pro Pro Gln Ala Phe Trp Gly Asn Ala Ser

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Ser Ile Ile Pro Ala Arg Ile Ala Tyr Tyr Leu Asn Leu Gln Gly Pro

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Gly Gly Val Ser Leu Tyr Pro Thr Pro Ile Ile Val Glx Val Phe Ala
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10Trp Cys Arg Tyr
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